

Application Serial No. 10/562,516
Reply to Office Action of September 26, 2007

PATENT
Docket: CU-4639

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Amendments to the Claims

The listing of claims presented below replaces all prior versions, and listings, of claims in the application.

Listing of claims:

1. (currently amended) A view angle control sheet comprising lens portions having trapezoidal shapes in cross section arranged at predetermined intervals, a wedge-shaped portion between the lens portions adjacent to each other is filled with the same material as that of the lens portions or with a material different from the lens portions, the wedge-shaped portion has a bottom surface on a screen image side while having a leading edge on an observer side with an outside light beam absorption effect, and the following ~~relationship is~~ relationships are held at least between a refractive index (N2) of a material constituting a slope portion of the wedge-shaped portion and a refractive index (N1) of a material constituting the lens portions:

$$N2 \leq N1 \text{ and } N1 - 0.01 \leq N2.$$

2. (previously presented) A view angle control sheet according to claim 1, wherein an angle (θ) (degree) formed by the slope portion and a normal line of a light beam outgoing plane exists in the following range:

$$3 \leq \theta \leq 20.$$

3. (previously presented) A view angle control sheet according to claim 2, wherein the following relationship is held further between the refractive indexes (N1) and (N2):

$$0.8N1 \leq N2 \leq 0.98N1.$$

4. (cancelled)

5. (cancelled)

6. (previously presented) A view angle control sheet according to claim 1, wherein a cross-sectional shape of the wedge-shaped portion is a substantial isosceles triangle.

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7. (previously presented) A view angle control sheet according to claim 1, wherein one of angles formed by two slopes of the wedge-shaped portion and the normal line of the light beam outgoing plane is larger than the other.
8. (previously presented) A view angle control sheet according to claim 1, wherein the slope portion has a curved cross-sectional shape or a polygonal-line cross-sectional shape such that the screen image side differs from the observer side in an angle formed by the slope portion and an observer side surface.
9. (cancelled)
10. (previously presented) A view angle control sheet according to claim 1, wherein light beam absorption particles are added to the wedge-shaped portion.
11. (previously presented) A view angle control sheet according to claim 10, wherein an average particle size of the light beam absorption particles is at least 1 μm and the average particle size is not more than two-thirds of a width of the bottom surface.
12. (previously presented) A view angle control sheet according to claim 10, wherein an addition amount of the light beam absorption particle ranges from 10 to 50 % by volume.
13. (previously presented) A view angle control sheet according to claim 1, wherein a function of any one of anti-reflection (AR), anti-static (AS), anti-glaring (AG), and a touch sensor or a plurality of functions thereof are imparted to at least one surface side.
14. (previously presented) A display device wherein a view angle control sheet according to claim 1 is bonded.
15. (previously presented) A display device wherein a view angle control sheet

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according to claim 1 is arranged in a crosswise stripe.

16. (previously presented) A display device wherein one view angle control sheet according to claim 1 is laminated on the observer side of a screen image source or two view angle control sheets according to claim 1 are laminated the observer side of the screen image source while being substantially orthogonal to each other.

17. (previously presented) A display device according to claim 16, wherein the width of the bottom surface is not more than $1/1.5$ of a size of one pixel.

18. (new) A view angle control sheet comprising lens portions having trapezoidal shapes in cross section arranged at predetermined intervals, a wedge-shaped portion between the lens portions adjacent to each other is filled with the same material as that of the lens portions or with a material different from the lens portions, the wedge-shaped portion has a bottom surface on a screen image side while having a leading edge on an observer side with an outside light beam absorption effect, and the following relationship is held at least between a refractive index ($N2$) of a material constituting a slope portion of the wedge-shaped portion and a refractive index ($N1$) of a material constituting the lens portions:

$$N2 \leq N1$$

and when a ratio of the refractive indexes ($N1$) and ($N2$) is $N2/N1=R$, the following relationship is held further in the angle (θ) (degree) formed by the slope portion of the wedge-shaped portion and a normal line of the light beam outgoing plane:

$$-0.01 < R \cdot \cos \theta < 0.002.$$

19. (new) A view angle control sheet according to claim 18, wherein an angle (θ) (degree) formed by the slope portion and a normal line of a light beam outgoing plane exists in the following range:

$$3 \leq \theta \leq 20$$

20. (new) A view angle control sheet according to claim 19, wherein the following relationship is held further between the refractive indexes ($N1$) and ($N2$):

$$0.8N1 \leq N2 \leq 0.98N1.$$

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21. (new) A view angle control sheet according to claim 18, wherein a cross-sectional shape of the wedge-shaped portion is a substantial isosceles triangle.
22. (new) A view angle control sheet according to claim 18, wherein one of angles formed by two slopes of the wedge-shaped portion and the normal line of the light beam outgoing plane is larger than the other.
23. (new) A view angle control sheet according to claim 18, wherein the slope portion has a curved cross-sectional shape or a polygonal-line cross-sectional shape such that the screen image side differs from the observer side in an angle formed by the slope portion and an observer side surface.
24. (new) A view angle control sheet according to claim 18, wherein light beam absorption particles are added to the wedge-shaped portion.
25. (new) A view angle control sheet according to claim 24, wherein an average particle size of the light beam absorption particles is at least 1 μm and the average particle size is not more than two-thirds of a width of the bottom surface.
26. (new) A view angle control sheet according to claim 24, wherein an addition amount of the light beam absorption particle ranges from 10 to 50% by volume.
27. (new) A view angle control sheet according to claim 18, wherein a function of any one of anti-reflection (AR), anti-static (AS), anti-glaring (AG), and a touch sensor or a plurality of functions thereof are imparted to at least one surface side.
28. (new) A display device wherein a view angle control sheet according to claim 18 is bonded.
29. (new) A display device wherein a view angle control sheet according to claim 18 is arranged in a crosswise stripe.

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30. (new) A display device wherein one view angle control sheet according to claim 18 is laminated on the observer side of a screen image source or two view angle control sheets according to claim 18 are laminated the observer side of the screen image source while being substantially orthogonal to each other.

31. (new) A display device according to claim 30, wherein the width of the bottom surface is not more than 1/1.5 of a size of one pixel.